Claims

What is claimed is:

1. A rotational coupling comprising:

a driven member including an inner surface that defines an opening and includes at least one contact surface;

a rotating shaft received in the opening of the driven member;

a coupling being operable to couple the rotor to the rotating shaft, and including at least one drive surface connected to, but separated a radial distance from, the rotating shaft; and

the at least one drive surface and the at least one contact surface being in contact over a planar contact area.

2. The rotational coupling of claim 1 wherein the coupling includes a pin at least partially received in a pin bore defined by the rotating shaft.

3. The rotational coupling of claim 1 wherein the portion of the driven member including the contact surface being comprised of a relatively weak material; and

the portion of the coupling including the drive surface being comprised of a relatively strong material.

4. The rotational coupling of claim 2 wherein the coupling includes at least one shoe trapped between the at least one contact surface of the driven member and the pin; and

the at least one shoe includes the at least one drive surface.

5. The rotational coupling of claim 4 wherein the at least one shoe being rectangular and including a centerline, and defining a bore positioned along the centerline; and

the pin being cylindrical and at least partially received in the bore.

6. The rotational coupling of claim 1 wherein the inner surface of the opening defined by the driven member and an outer surface of the rotating shaft including concentric alignment surfaces in contact with one another.

7. The rotational coupling of claim 2 wherein the pin includes a cylindrical portion at least partially received in the pin bore; and

the pin bore being perpendicular to an axis of the rotating shaft.

8. The rotational coupling of claim 1 wherein the at least one drive surface includes a first drive surface and a second drive surface located on opposite sides of the rotating shaft, and the at least one contact surface includes a first contact surface and a second contact surface; and

the first drive surface and the second drive surface and the first contact surface and the second contact surface contacting over a first planar contact area and a second planar contact area, respectively.

9. The rotational coupling of claim 8 wherein the first drive surface being included on a first shoe that is trapped between a the first contact surface and a pin; and

the second drive surface being included on a second shoe that is trapped between the second contact surface and the pin.

10. The rotational coupling of claim 9 wherein the first shoe and the second shoe being rectangular, comprised of a relatively strong material, radially separated from an outer diameter of the rotating shaft by a predetermined distance, and each defining a bore along a centerline;

the pin being cylindrical and at least partially received in the bore;

the driven member being comprised of a relatively weak material;

a pin bore defined by the rotating shaft being perpendicular to an axis of the rotating shaft; and

the inner surface of the opening defined by the driven member and an outer surface of the rotating shaft including concentric alignment surfaces in contact with one another.

11. A pump comprising:

a pump housing;

a rotational coupling positioned within the pump housing; and

the rotational coupling including a rotor with an inner surface that defines an opening and includes at least one contact surface; a rotating shaft received in the opening of the rotor; and a coupling being operable to couple the rotor to the rotating shaft, and including at least one drive surface radially separated from, but connected to, the rotating shaft; and

the at least one drive surface and the at least one contact surface being in contact over a planar contact area.

12. The pump of claim 11 wherein the coupling includes a pin at least partially received in a pin bore defined by the rotating shaft.

13. The pump of claim 12 wherein the portion of the rotor including the at least one contact surface being comprised of a powered metal, and the portion of the coupling including the at least one drive surface being comprised of steel.

14. The pump of claim 13 wherein the at least one drive surface includes a first drive surface and a second drive surface located on opposite sides of the rotating shaft, and the at least one contact surface includes a first contact surface and a second contact surface; and

the first drive surface and the second drive surface and the first contact surface and the second contact surface contacting over a first planar contact area and a second planar contact area, respectively.

15. The pump of claim 14 wherein the first drive surface being included on a first shoe that is trapped between the first contact surface and the pin;

the second drive surface being included on a second shoe that is trapped between the second contact surface and the pin; and

each shoe being radially separated from an outer diameter of the rotating shaft by a predetermined distance.

16. The pump of claim 15 wherein the pump housing includes a centerline;

the rotating shaft and the centerline of the pump housing being offset and parallel; and

an electric motor included within the pump housing and attached to the rotating shaft.

17. The pump of claim 16 wherein the inner surface of the rotor includes an alignment portion between a first drive portion and a second drive portion;

the alignment portion includes a concentric alignment surface, the first drive portion includes the first contact surface, and the second drive portion includes the second contact surface; and

the concentric alignment surface and an outer surface of the rotating shaft include a concentric alignment contact area.

18. A method of reducing stress within a rotational coupling comprising a step of:

distributing a driving force from a rotating shaft over a planar contact area on a driven member;

separating a drive surface a radial distance from, but connecting the drive surface to, the rotating shaft.

19. The method of claim 18 wherein the step of distributing includes a step of positioning a steel shoe between a pin and a powered metal rotor.